BULLETIN

of the

ONTARIO COLLEGE OF PHARMACY

Vol. V, No. 1 TORONTO, Ontario January, 1956
H. J. Fuller, Editor

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The Canadian Pharmaceutical Association

14th Annual Survey

In the past four years the Canadian Pharmaceutical Association Annual Survey has made history. It has been commented upon in the CHEMIST AND DRUGGIST, London, England, reviewed in the AMERICAN DRUGGIST and alluded to at the General Assembly of the Fédération Internationale Pharmaceutique, London, England, September, 1955.

The replies received in the past four years have been:

	Ontario	Canada
1951	78	149
1952	114	250
1953	95	225
1954	182	418
1955	?	?

The Survey provides pharmacists with goals to achieve and guideposts to follow. The Questionnaire for the 1955 Survey has been mailed to you. The larger the number of replies we receive the more accurate will be the guideposts.

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The Ontario College of Pharmacy is the pharmaceutical licensing body for the Province of Ontario, Canada. All pharmacists licensed in Ontario are *IPSO FACTO* members of the College.

The majority of contributors to the Bulletin are members of the Faculty of Pharmacy, University of Toronto. However, contributions are welcomed from all members of the College.

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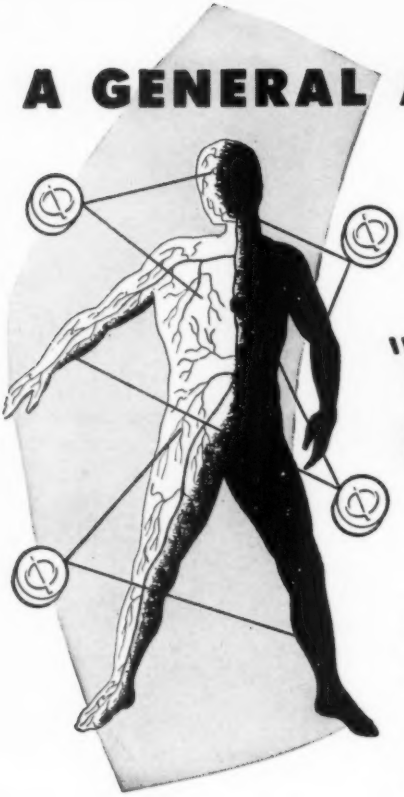
A GENERAL ANALGESIC

for relief of

PAIN



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ACTION STARTS IMMEDIATELY

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MONTREAL CANADA

A GILT-EDGED INVESTMENT FOR THE NEW YEAR

Dr. F. N. Hughes

This is the time for making New Year's resolutions. It is the time when most of us give at least a passing thought to things we have intended but failed to do. And so, it is that we take this occasion to remind pharmacists who read the Bulletin of one of the best resolutions which they can make. It concerns a recommendation which we and others have made many times, one which if followed by practising pharmacists, might well profoundly influence the future practice of pharmacy in Canada.

It has often been pointed out that a dispensary library is essential. In any minimum list of such reference materials two monthly journals in particular have been recommended: American Professional Pharmacist, and Journal of the American Pharmaceutical Association, P r a c t i c a l Pharmacy edition. In support of this proposal it has been emphasized that the pharmacist who fails to read such journals regularly cannot hope to be well-informed with respect to the constantly changing field of medication.

And so we suggest now at the beginning of a new year, and hence new volumes of each of these journals, that members of the College, who do not already receive these publications, subscribe now to one or both. As evidence for the wealth of valuable material contained in each issue, we present herein a brief summary of the features and articles in the September, 1955 issue of the Journal of the American Pharmaceutical Association, Practical Pharmacy edition. A study of this one issue will reveal the potential value of the Journal to every pharmacist.

"℞ **Information Service**"—Answers to queries, e.g. a prescription dosage problem, a formula for a washable Tyrothricin Compound Ointment, formulas for a silicone hand lotion.

"Hospital Pharmacy"—regular section, includes 1954 statistics re hospitals.

"Progress in Medicine"—selected abstracts from various medical journals, e.g. "Loberline as a Smoking Deterrent", "Plaqueril—Clinical Trial of Antimalarial".

"How to Select An Ointment Base"—a very useful table reproduced from Archives of Dermatology, classifying 16 different ointment bases using 9 different criteria for each, so one may tell almost at a glance the relative merits of each base.

"On the Economic Side"—a section devoted to economic aspects of practice, e.g. Delivery Costs, Failures Among Pharmacies, Prescription Survey.

"Education for Pharmacists"—an article by L. E. Kazin discussing the role of the pharmaceutical press as a medium for post-graduate education.

"A New Improved Lotion Vehicle"—reporting results of a study at Purdue University by Barker, Shakeen and DeKay to determine a lotion formulation stable and compatible with 1% Phenol and 10% Coal Tar Solution.

"Census of Pharmacy"—valuable reference figures respecting United States pharmacy: number of pharmacies, pharmacists, age classification, vocational distribution (retail 86.6%, hospital 4.0%, manufacturing and distribution 5.6%, education, government and other 3.8%), extent of college training (still just 49.0% are 4 year graduates even after about 20 years of the 4-year course).

"Incompatibilities of Prescription Specialties"—report of compatibility studies on Pamine and Pamine with Phenobarbital Elixir; pH values for 60 prescription ingredients also given—a useful study and valuable as a type of research which could well be done by groups of pharmacists.

"New Prescription Products"—four pages of description of new specialties.

One can well imagine the potential value of **twelve** such issues as the above. The annual subscription rate is $5.00. The address is 2215 Constitution Avenue, Washington, D.C.

Space does not permit a similar summary of the other equally good journal — **American Professional Pharmacist,** 676 Northern Blvd., Great Neck, L.I., N.Y.

It differs mainly in that it contains more review articles on newer therapeutic substances. Consequently the two publications complement each other. Ideally, one should subscribe to both; definitely at least one should be read regularly by **every** practising pharmacist.

As we extend New Year's Greetings to the members of the College we express the hope that each may "follow through" on this New Year's resolution.

F. N. HUGHES

CHOLESTEROL LEVELS

The New York Times reports that studies in Britain suggest that active men are not so prone to coronary heart attacks as are sedentary men. Studies made at the University of Minnesota suggest that exercise after breakfast may reduce the cholesterol levels in the blood. Cholesterol levels were measured before breakfast in both sedentary and active subjects and again a few hours after breakfast. The levels were higher after breakfast in sedentary men but the difference did not maintain in active men. These new researches suggest the mechanism for the further connection between physical activity and this heart disease, if, indeed, cholesterol level is linked to the danger of a coronary.

DRESS UP YOUR PRESCRIPTIONS

Every pharmacist should be interested in handing to his customer a prescription which is not only compounded accurately but is also packaged attractively. Many times it requires only a moment upon the part of the dispenser or his assistant to add that "something extra" to give the prescription package that attractive packing. This serves two purposes, namely, it shows a professional pride on the part of the pharmacist and it also impresses your customer so that he has a better opinion of you as a pharmacist and your pharmacy as a dispensary.

There are many common items available to us, at relatively little expense, for use in this manner. We have only to observe the manner of packing of many of the pharmaceutical specialty products in our dispensaries to see the results of the extensive research in customer appeal carried out by the individual companies on the type of container, label, and packing.

Perhaps one of the most important items to be considered here is the wrapping of the prescription. There are several pharmacies who use a cellophane wrapping on the prescription bottle. "Cellosheet" is a brand of cellophane which can be used for this purpose. It is a cellophane which is self-adhesive upon moistening. The use of a clear wrapper of this nature results in a package which is attractive and neat. The cost of such a wrapping would be approximately one-half cent a prescription.

The final wrapping of the prescription itself should next be considered. There are many of our stores which have used and are using white as the theme in their open or semi-open dispensaries. White is used, of course, to emphasize cleanliness, aseptic conditions, and a modern trend away from the older darker closed in type unit. Would it not be an excellent idea then to extend this idea to the wrapping of our prescription items? It is so much nicer to receive a package wrapped in white paper or in a prescription envelope, if the package is small. By prescription envelopes, we mean one which is relatively plain with only such notations as "So and So's Prescription Pharmacy" or "A Prescription from So and So's Pharmacy". It is not very pleasant to receive a package of medication prescribed by a physician but dispensed in a "counter" envelope with, in addition to your name, an advertising plug like "Use Tom Thumb's Plums—They are the Best".

The container used in packaging the prescription should be the correct size. Do not, for instance, dispense a 4 fl. oz. mixture in a 6 fl. oz. bottle just because you did not have the foresight to keep a suitably adequate stock of the more common sizes on hand.

The top of bottles containing liquids can be easily taped on using one of the many plastic adhesive tapes available. This idea serves two purposes, it demonstrates to the customer (if the prescription is to be delivered) that the product is exactly as it was when it left your dispensary and it also prevents the loss of contents due to a faulty cap or a cap which becomes loosened in the handling of the package.

For special products such as nasal solutions or ophthalmic solutions, it is a wise idea to include a small label which clearly indicates the function of the particular solution. The use of a "Nose Drops" or "Eye Drops" label clearly indicates this.

In packaging capsules, it should be noticed that manufacturers tend to use cellophane packing. The reason for this seems readily apparent. If there is any possibility of moisture (and many medicines including capsules are stored in the medicine chest in the bathroom) the fine strands of cotton will adhere to the moistened surface of the gelatin capsules giving an unsightly appearing product. Though undoubtedly this is the fault of the customer, is it not simpler to avoid any discussion, heated or otherwise with them, by simply doing away with the use of cotton packing whenever gelatin capsules of any form are dispensed?

The cost of improving our dispensed or compounded prescriptions is indeed small when we consider the effect of the improved appearance on the customer. He will have no hesitation in returning again and again to a pharmacy where his prescriptions are dispensed carefully and packaged attractively. This it would seem like an extremely worthwhile investment on the part of the pharmacist.

D. R. KENNEDY.

Research in business differs from research in the natural sciences. It is not so much the making of a laboratory experiment as it is the close observation, analysis and description of past and present business practices.

MANAGEMENT EFFICIENCY IN ONTARIO

What will it be, a new Ford, Meteor, Chevrolet, Plymouth or a new Cadillac in 1956? You can have one of these new cars if you are able to match the management efficiency of the 25 Ontario pharmacies that produced a net profit of 10% or better of sales in 1954.

The chart on the following page compares the essential data concerning merchandise cost, expenses, and net profit of Ontario pharmacies in the Canadian Pharmaceutical Association 1954 Survey that reported a net profit of 10% or better of sales with those reporting a net profit below 10% of sales. **(These two groups will be referred to in this article as Above 10% and Below 10%).** By doing so the specific areas in which efficient management produced a greater net profit can be pin-pointed.

Group A of the Chart compares the 25 pharmacies reporting net profit above 10% of sales with the 157 pharmacies reporting net profit below 10%. These represent 13.74% of the total of 182 pharmacies reporting from Ontario. On the average the **Above 10%** paid 3.3% less for their merchandise, had total expenses 6.61% of sales less, and net profit 9.86% of sales more than the **below 10%.**

ONTARIO—1954

Cost of Goods Sold	Proprietor's Salary	Employees' Wages	Rent	Depreciation	Interest	Miscellaneous Expenses	All Other Expenses	Total Expenses	Net Profit	Total Income	Average Sales	Average Inventory	Turnover	Net Profit
A							**All Ontario Pharmacies**							
66.4	5.84	7.95	1.88	0.74	0.13	0.94	3.08	20.56	13.03	$13,367	$73,836	$14,062	3.5	Above 10%
69.7	8.15	9.83	2.26	1.07	0.33	1.72	3.81	27.17	3.90	$ 8,867	$82,508	$13,581	4.0	Below 10%
3.3	2.31	1.88	0.38	0.33	0.20	0.78	0.73	6.61	9.86	$ 4,500	$ 8,672	$ 481	0.5	Differential
B							**Sales Volume $30,000 to $50,000**							
67.8	7.74	5.36	2.23	0.90	0.24	0.60	2.62	19.69	12.52	$ 8,647	$43,061	$ 9,118	3.3	Above 10%
70.0	10.65	6.78	2.35	1.05	0.54	1.60	4.37	27.34	2.70	$ 5,904	$42,316	$ 9,221	3.7	Below 10%
2.8	2.91	1.42	0.12	0.15	0.30	1.00	1.75	7.65	9.82	$ 2,743	$ 745	$ 103	0.4	Differential
C							**Sales Volume $50,000 to $75,000**							
64.0	5.88	7.42	2.00	1.06	0.18	1.19	4.11	21.84	14.16	$12,165	$61,535	$13,145	3.4	Above 10%
70.0	9.28	8.88	2.08	1.10	0.35	1.67	3.60	26.96	3.05	$ 7,763	$62,600	$11,839	4.4	Below 10%
6.0	3.40	1.46	0.08	0.04	0.17	0.48	0.51	5.12	11.11	$ 4,402	$ 1,065	$ 1,306	1.0	Differential
D							**Sales Volume $75,000 to $100,000**							
67.0	4.91	9.73	1.68	0.64	0.06	0.84	2.63	20.49	12.54	$13,610	$83,604	$15,412	3.7	Above 10%
70.7	6.31	10.92	2.52	1.12	0.28	1.60	3.60	26.35	3.00	$ 7,950	$84,545	$15,405	4.3	Below 10%
3.7	1.40	1.19	0.84	0.48	0.22	0.74	0.97	5.86	9.54	$ 5,660	$ 941	$ 7	0.6	Differential
E							**Sales Volume $100,000 to $150,000**							
66.0	4.20	10.7	1.5	0.33	0.00	1.28	2.69	20.70	13.23	$20,419	$115,369	$20,072	3.9	Above 10%
68.4	6.50	12.3	1.1	1.02	0.21	2.27	4.31	27.71	3.90	$12,694	$119,125	$19,370	4.4	Below 10%
2.4	2.30	1.6	0.4	0.69	0.21	0.99	1.62	7.01	9.33	$ 7,725	$ 5.756	$ 702	0.5	Differential

Cost of Merchandise

When the 182 pharmacies are classified according to sales volume we find that the differential in the cost of merchandise ranges all the way from 2.4% in Group E to 6.0% in Group C. The reasons for this differential may be numerous. No doubt it is the sum of several factors. If we look at the interest expense column in the chart we find that the **Below 10%**, Groups B.C. and D, paid from 2 to 4 times as much as the **Above 10%**, while in Group E the **Above 10%** had no interest expenses at all. Were the 25 **Above 10%** in better financial condition and therefore able to avail themselves of more cash discounts? The turnover column is very interesting since it shows that the most profitable pharmacies had a lower rate of turnover than the less profitfiable ones. This is contrary to popular opinion. Looking at the Average Inventory column we notice no appreciable difference in inventories. It is reasonable to conclude that the **Above 10%** maintained more adequate stocks of much-wanted merchandise and were able to buy it in larger quantities and possibly obtaining a better discount. In other words, their average inventories contained less dead stock and slow moving items than the **Below 10%**. Still another reason may be a larger amount of prescription sales. Sixty-eight percent of the **Above 10%** reported Prescription sales and 20% of the **Above 10%** reported prescription sales over 20% of total sales. Chart 15 of the C.Ph.A. 1954 Survey, published in the August 1, 1955 issue of the C.Ph.J. shows 15 Ontario pharmacies with prescription sales over 20% of total sales and their cost of merchandise sold was 64.4% of sales compared with 69.2% for all 182 Ontario pharmacies reporting. Only 45.2% of the **Below 10%** reported prescription sales and only 10 or 6.3% of the **Below 10%** reported prescription sales above 20% of total sales. Hence, the cost of merchandise is effected by the volume of prescription sales. The other side of the coin is the fact that a larger volume of sales in magazines, newspapers, tobacco, and proprietary medicines increases the cost of merchandise since the gross margin usual on these items ranges from 12 to 23% of sales.

Proprietor's Salary and Net Profit

Proprietor's salary is remuneration for managing the pharmacy. Net Profit is a return on the capital investment. The cost of management is a legitimate cost to the pharmacy (however, the pharmacist must pay income tax on it). Only after all costs of operation including the proprietor's salary have been deducted from gross profit do we get the net profit on investment. It is the proprietor-manager's privilege to take a large salary, thereby increasing his total expenses and decreasing his net profit, or to take a small salary, thereby decreasing his total expenses and increasing his net profit. It adds up to the same thing in dollars both for income tax purposes and as far as "take-home-pay", that is Total Income, is concerned. The significant fact is the comparison of Total Income Dollars between the **Above 10%** and the **Below 10%**. The **Above 10%** or **Below 10%** can be manipulated but the total number of Total Income Dollars remains the same.

The Chart shows that the differential between the **Above 10%** and the **Below 10%** ranged from $2,743 to $7,725. More dramatically, the range is from the approximate price of a new Ford, Meteor, Chevrolet or Plymouth to a new Cadillac. The difference is due only to two factors, the cost of the merchandise and operating expenses exclusive of proprietor's salary.

Operating Expenses

Employees' Wages—the **Above 10%** seem to have been able to operate with a lower ratio of employees' wages to sales than the **Below 10%**. This does not mean that the **Above 10%** necessarily paid lower wages than the **Below 10%**. It could mean that the **Below 10%** were somewhat overstaffed or it could mean that in the **Above 10%** the proprietor put in longer hours. In any case the differential ranged from 1.19% in Group D, that is from $892 - $1,190 to 1.6% in Group E, that is $1,600 - $2,400 depending on the volume of sales. The overall differential of employees' wages in Group A, namely 1.88% is larger than in any of the Groups B, C, D, and E because 22 pharmacies out of the 182 reporting had sales either below $30,000 or above $150,000 but none of these reported net profit above 10%.

Depreciation—There is some differential in all Groups, B, C, D and E, the **Above 10%** all reporting lower depreciation charges. They may all have been established longer and hence have written off large amounts of depreciation in previous years, or some of the **Below 10%** may have taken the full amount of depreciation permissible in order to reduce their taxable net profit.

Miscellaneous Expenses—the differential is roughly from ½ to 1% higher for the **Below 10%** group. In the case of Group E it amounts to almost $1,500 for the highest volume pharmacies. Miscellaneous expenses is a catch-all for all otherwise unclassified expenses. It can include a lot of small, possibly unnecessary, expenses which add up to considerable volume in the long run. Good management should watch this category carefully.

All Other Expenses include such items as utilities, advertising, delivery expenses, repair, and bad debts. Here again, with the exception of Group C, the **Below 10%** are higher than the **Above 10%**.

Conclusion

Careful and efficient management will attempt to eliminate every unnecessary expense, that is, every expense that can be curtailed without danger of loss of sales. Sometimes they cannot be reduced. The alternative is to attempt to increase sales without any increase in expense unless it be a reasonable increase in advertising or other public relations activities. However, in the groups illustrated in the chart the average sales volume of the **Below 10%** and the **Above 10%** are approximately the same indicating that what one person can do with a certain sales volume others, likewise should attempt to attain.

H. J. FULLER

HOSPITAL PHARMACY SURVEY

Part II

The type and scope of pharmaceutical service required by a hospital varies with the type of ownership and control of the individual hospital as well as with the type of patients treated by each institution. The length of the patients' stay in hospital is also a determining factor in the amount of pharmaceutical service demanded for adequate patient care.

In 1954, there were a total of 1,398 hospitals in Canada (1). Of these, 1,009 were classified as "public hospitals"; i.e. hosiptals not operated for profit, owned by lay corporations, religious organizaitons, municipal bodies or the provincial government and which admit all patients regardless of their ability to pay. "Private hospitals", those which ordinarily restrict their admissions to pay patients and operated by private individuals or companies, numbered 251. The remaining 138 institutions were operated by the Federal Government and include hospitals which come under the jurisdiction of the Department of National Health and Welfare, the Department of National Defence and the Department of Veterans' Affairs.

These 1,398 hospitals provided 186,562 beds for patient care and were scattered throughout the ten provinces, the Northwest Territories and the Yukon. The bed capacity of the individual institution varied from 4 to 1,418 beds. Public hospitals accounted for 164,490 beds or 88% of the total bed capacity of Canadian hospitals. Of these, 77,522 beds were located in 829 public general hospitals, which were utilized for the treatment of a wide range of conditions, while 86,968 beds were located in 180 public special hospitals, which provided treatment for particualr conditions such as alcoholic, chronic, contagious, convalescent, mental and tuberculosis patients, etc.

The majority of the former were also known as "short term hospitals", while those in which the patient's stay is not limited to a period of thirty days, were referred to as "long term hospitals".

Standards for pharmaceutical service, now in existence, are predicated on the assumption that the services of at least one full-time hospital pharmacist are required in all short term, public general hospitals of 100 beds and over. In the majority of the 50 bed hospitals of the same type, the employment of a part-time pharmacist is feasible if other administrative duties are undertaken by this employee, such as purchasing, etc. In order to give a true picture of the pharmaceutical service in our Canadian hospitals, questionnaires for this survey were sent to the administrators of a total of 673 institutions, representing all the hospitals of 50 beds or more. A total of 321 replies or a return of 47.69% was received. Two hundred and twenty or 32.68% of the hospitals employ a pharmacist. One hundred and fifty-one replies or 68.01% were received from these hospitals.

TABLE 1

Province	No. of Hospitals with 50 beds or more	Total number of Replies	% of Replies to No. of Hospitals with 50 beds or more	No. of Hospitals Employing a Pharmacist	% of Hospitals employing a Pharmacist to No. of Hospitals with 50 beds or more	No. of Replies from Hospitals employing a Pharmacist	% of Replies from Hospitals employing a Pharmacist to No. of Hospitals employing a Pharmacist
Alberta	48	25	52.08%	17	35.41%	15	88.23%
British Columbia	59	36	61.01%	17	28.81%	16	94.11%
Manitoba	28	15	53.57%	14	53.57%	9	64.28%
New Brunswick ..	24	11	45.83%	10	41.66%	5	50.00%
Newfoundland	11	4	36.36%	2	18.18%	1	50.00%
Nova Scotia	41	24	58.53%	13	31.70%	10	76.92%
Ontario	234	126	53.84%	67	28.63%	57	85.07%
Prince Edward Island	6	2	33.33%	1	16.66%	1	100.00%
Quebec	178	48	26.96%	65	34.26%	24	36.92%
Saskatchewan	38	27	71.05%	16	31.57%	13	81.25%
Yukon & North West Territories	6	3	50.00%	0	0%	0	0
TOTAL	673	321	47.69%	222	32.68%	151	68.01%

RETURN

1.—Geographical Distribution of Hospitals Surveyed

The geographical distribution of the 673 institutions solicited is shown in Table 1. Sixty-one percent of these hospitals are located in Ontario and Quebec and approximately 35% are situated in the single province of Ontario. This province offers the greatest number of opportunities to practice hospital pharmacy and it would seem logical that the training in this specialty should be undertaken by the Faculty of Pharmacy at the University of Toronto to supply the demands of these hospitals.

2.—Replies Received

A total of 321 replies were received from the 673 hospitals or a 47.54% return (Table 1). Saskatchewan, British Columbia, Nova Scotia, Manitoba, Ontario, Alberta and the Yukon and the Northwest Territories showed a return of 50% and over. The results of the survey would therefore appear to be more representative of the practice of hospital pharmacy in Western Canada than of that in the Eastern provinces.

3.—Hospitals Employing a Pharmacist

Two hundred and twenty hospitals out of a total of 673, or 32.68%, reported that they employed one or more pharmacists at the present time (Table 1). The employment of pharmacists by hospitals appears to be more widely accepted in Manitoba, New Brunswick, Alberta and Quebec than in the other provinces. Nova Scotia and Saskatchewan, with 31.70% and 31.57% respectively, are not far below the 32.68% for the total of 220 hospitals. However, British Columbia and Ontario with 28.81% and 28.63% respectively, representing 293 of the total hospitals solicited present a challenge to those engaged in the education and recruitment of pharmacy students.

4.—Replies from Hospitals Employing a Pharmacist

Of the total 321 replies received, 151 were from the 220 hospitals which employ a pharmacist, representing 68.01% (Table 1). The survey should reveal much pertinent information relative to the practice of hospital pharmacy in Prince Edward Island, British Columbia, Alberta, Ontario, Nova Scotia and Saskatchewan. More information from Manitoba, New Brunswick, Newfoundland, Quebec and the Yukon and Northwest Territories would be desirable. No French language forms were distributed in Quebec, which may account in part for the small return from that province.

A further installment of this Survey will appear in the March issue of the Bulletin.

(1) Canadian Hospital Directory, Canadian Hospital Association, April, 1955, Toronto, Ontario.

H. J. FULLER I. E. STAUFFER

AMERICAN STATISTICS INAPPROPRIATE TO CANADA

For the past twenty-three years the Lilly Digest has been the paragon of operating costs and profits of retail pharmacies in the United States. For the past four years the Canadian Pharmaceutical Association has collected figures on the costs and profits of Canadian pharmacies. The Canadian figures have been published annually in the Canadian Pharmaceutical Journal, the last one, for 1954, being published in the August 1, 1955 issue.

Among other things, the Canadian Survey classifies pharmacies according to Sales Volume and Population Size so that each pharmacist can locate, in the numbered charts, a column of figures on the operation of pharmacies with the same approximate sales volume and located in cities, towns, or villages similar in population size to his own. These **norms** are excellent guide-posts for every pharmacist in Canada. The last Survey occupied some twenty pages. Twenty pages of statistics may be rather dry reading but each indivdual column of figures is of vital interest to all pharmacists in the same classification.

A few months ago, the "Lilly digest cost finder" was distributed in Canada. This is a very handy gadget for American pharmacists. It consists of a wheel which revolves on another larger wheel and exposes only one column of figures at a time through a window. Each sales volume and population size may be found in a matter of seconds and the "wheel" is vastly superior to pages of columns of figures as far as hunting-time is concerned. However, a comparison of the figures on this "wheel" with the figures of the Canadian Pharmaceutical Association's Survey reveals that American figures are as inappropriate for use in Canada as Canadian figures are for use in the United States. Because of the danger involved in using this "wheel" in Canada for management purposes, I feel that I must point out why it is misleading to assume that the figures are applicable to Canadian pharmacies.

The following pages chart the comparison of American pharmacies with Ontario pharmacies. A quick glance will show that there are wide differences in merchandise costs, expenses, and profits in many categories. The comparison is made between the sales volume and population size of the "wheel" (the Lilly digest cost finder) and similar sales volume and population size in **Ontario.** There may be many reasons for the differences but that is not the purpose of this article. The purpose is to demonstrate to the pharmacists of Ontario the danger inherent in using American figures as appropriate in Canada.

There were 1621 pharmacies repesented in the Lilly Digest for 1954 and this large number made 49 categories possible, a larger number than was possible with the 418 pharmacies represented in the Canadian Survey. However these 1621 pharmacies represented only 3.04% of all pharmacies in the United States, whereas the 418 Canadian pharmacies represented 9.21% of all Canadian pharmacies. Further, the 182 Ontario pharmacies compared in the following charts represented 9.34% of all pharmacies in Ontario in 1954. These 9.34% of Ontario pharmacies had 13.26% of all the retail pharmacy sales in Ontario and hence should be representative pharmacies.

	SALES VOLUME $20,000 to $30,000				SALES VOLUME $30,000 to $50,000			
	Under 2,500 Population				Under 2,500 Population			
	Ont.	U.S.	U.S. *L	U.S. *H	Ont.	U.S.	U.S. *L	U.S. *H
Cost of Goods Sold	73.7	67.0	6.7	....	70.2	69.0	1.2	....
Proprietor's Salary	12.0	11.0	1.0	....	10.2	8.0	2.2	....
Employees' Wages	2.6	5.0	....	2.4	6.4	5.0	1.4	....
Rent	1.6	3.0	....	1.4	1.8	2.0	....	0.2
Total Expenses	23.7	26.3	....	2.6	25.0	22.5	2.5	....
Net Profit	2.6	6.7	....	4.1	4.8	8.5	....	3.7

SALES VOLUME $30,000 TO $50,000

	2,500 to 5,000 Popul.				5,000 to 20,000 Popul.			
	Ont.	U.S.	U.S. *L	US *H	Ont.	US	US *L	US *H
Cost of Goods Sold	69.8	67.0	2.8	....	68.4	64.0	4.4	....
Proprietor's Salary	7.2	10.0	....	2.8	9.9	9.0	0.9	....
Employees' Wages	4.9	6.0	....	1.1	6.9	6.0	0.9	....
Rent	1.8	2.0	....	0.2	2.8	3.0	....	0.2
Total Expenses	22.4	25.9	....	3.5	26.0	24.7	1.3	....
Net Profit	7.8	7.1	0.7	....	5.6	11.3	....	5.7

	20,000 to 50,000 Popul.				50,000 to 100,000 Popul.			
	Ont.	US	US *L	US *H	Ont.	US	US *L	US *H
Cost of Goods Sold	71.5	65.0	6.5	....	64.4	65.0	....	0.6
Proprietor's Salary	10.3	9.0	1.3	....	9.8	10.0	....	0.2
Employees' Wages	4.9	6.0	....	1.1	9.8	6.0	3.8	....
Rent	1.8	3.0	....	1.2	2.0	3.0	....	1.0
Total Expenses	25.3	24.9	0.4	....	26.5	24.6	1.9	....
Net Profit	3.2	10.1	....	6.9	9.1	9.4	....	0.3

	100,000 to 500.000 Popul.				Over 500,000 Popul.			
	Ont.	US	US *L	US *H	Ont.	US	US *L	US *H
Cost of Goods Sold	67.9	66.0	1.9	....	71.6	64.0	7.6	....
Proprietor's Salary	13.0	10.0	3.0	....	8.9	8.0	0.9	....
Employees' Wages	8.1	7.0	1.1	....	4.2	4.0	0.2	....
Rent	1.7	4.0	....	2.3	4.1	4.0	0.1	....
Total Expenses	30.2	30.5	....	0.3	24.8	22.4	2.4	....
Net Profit	1.9	3.5	....	1.6	3.6	13.6	....	10.0

*L—means lower than Ontario.
*H—means higher than Ontario.

SALES VOLUME $50,000 TO $75,000

	Under 2,500 Population				2,500 to 5,000 Population			
	Ont.	U.S.	U.S. L	U.S. H	Ont.	US	US L	US H
Cost of Goods Sold	71.0	68.0	3.0	....	71.5	68.0	3.5	....
Proprietor's Salary	6.7	7.0	....	0.3	6.9	7.0	....	0.1
Employees' Wages	7.4	8.0	....	0.6	7.4	9.0	....	1.6
Rent	1.0	2.0	....	1.0	1.6	2.0	....	0.4
Total Expenses	22.1	24.4	....	2.3	23.0	24.6	....	1.6
Net Profit	6.9	7.6	....	0.7	5.5	7.4	....	1.9

	5,000 to 20,000 Population				20,000 to 50,000 Population			
	Ont.	U.S.	U.S. L	US H	Ont.	US	US L	US H
Cost of Goods Sold	68.0	66.0	2.0	....	65.7	66.0	....	0.3
Proprietor's Salary	9.9	7.0	2.9	....	9.5	9.0	0.5	....
Employees' Wages	6.1	9.0	....	2.9	12.7	10.0	2.7	....
Rent	2.2	2.0	0.2	....	2.2	3.0	....	0.8
Total Expenses	25.4	24.4	1.0	....	29.3	28.0	1.3	....
Net Profit	6.6	9.6	....	3.0	5.0	6.0	....	1.0

	100,000 to 500,000 Popul.				Over 500,000 Population			
	Ont.	U.S.	US L	US H	Ont.	US	US L	US H
Cost of Goods Sold	69.6	65.0	4.6	....	70.9	67.0	3.9	....
Proprietor's Salary	8.5	8.0	0.5	....	10.1	8.0	2.1	....
Employees' Wages	10.5	8.0	2.5	....	9.0	9.0	....	....
Rent	2.2	3.0	....	0.8	2.5	3.0	....	0.5
Total Expenses	27.6	25.9	1.7	....	28.6	29.0	....	0.4
Net Profit	2.7	9.1	....	6.4	0.5	4.0	....	3.5

SALES VOLUME $75,000 TO $100,000

	Under 2,500 Population				2,500 to 5,000 Population			
	Ont.	U.S.	US L	US H	Ont.	US	US L	US H
Cost of Goods Sold	74.9	68.0	6.9	....	68.7	68.0	0.7	....
Proprietor's Salary	4.9	7.0	....	2.1	7.3	7.0	0.3	....
Employees' Wages	5.8	10.0	....	4.2	9.3	10.0	....	0.7
Rent	1.3	2.0	....	0.7	1.4	2.0	....	0.6
Total Expenses	19.0	25.4	....	6.4	23.0	25.2	....	2.2
Net Profit	6.1	6.5	....	0.4	8.3	6.8	1.5	....

SALES VOLUME $75,000 TO $100,000

	5,000 to 20,000 Population				20,000 to 50,000 Population			
	Ont.	U.S.	U.S. L	US H	Ont.	US	US L	US H
Cost of Goods Sold	69.8	67.0	2.8	....	69.2	66.0	3.2	....
Proprietor's Salary	5.9	7.0	....	1.1	5.7	7.0	....	1.3
Employees' Wages	10.3	10.0	0.3	....	9.9	11.0	....	1.1
Rent	1.8	2.0	....	0.2	2.9	2.0	0.9	....
Total Expenses	24.7	26.4	....	1.7	23.6	27.4	....	3.8
Net Profit	5.5	6.6	....	1.1	7.2	6.6	0.6	....

	50,000 to 100,000 Population				100,000 to 500,000 Population			
	Ont.	U.S.	U.S. L	US H	Ont.	US	US L	US H
Cost of Goods Sold	64.0	67.0	....	3.0	68.7	68.0	0.7	....
Proprietor's Salary	8.9	8.0	0.9	....	3.8	8.0	....	4.2
Employees' Wages	12.2	11.0	1.2	....	15.1	12.0	3.1	....
Rent	5.0	3.0	2.0	....	2.7	3.0	....	0.3
Total Expenses	31.5	28.4	3.1	....	28.1	30.1	....	2.0
Net Profit	4.5	4.6	....	0.1	3.1	1.9	1.2	....

	Sales Volume $75,000 to $100,000				Sales Volume $100,000 to $150,000			
	Over 500,000 Population				2,500 to 5,000 Population			
	Ont.	U.S.	U.S. L	US H	Ont.	US	US L	US H
Cost of Goods Sold	71.7	68.0	3.7	....	68.0	67.0	1.0	....
Proprietor's Salary	8.5	7.0	1.5	....	7.5	6.0	1.5	....
Employees' Wages	9.5	9.0	0.5	....	13.9	12.0	1.9	....
Rent	2.8	3.0	....	0.2	1.7	2.0	....	0.3
Total Expenses	26.9	26.8	0.1	....	26.1	28.1	....	2.0
Net Profit	1.4	5.2	....	3.8	5.1	4.9	0.2	....

SALES VOLUME $100,000 TO $150,000

	5,000 to 20,000 Population				20,000 to 50,000 Population			
	Ont.	U.S.	U.S. L	US H	Ont.	US	US L	US H
Cost of Goods Sold	67.5	66.0	1.5	....	66.5	66.0	0.5	....
Proprietor's Salary	7.0	7.0	....	....	6.3	7.0	....	0.7
Employees' Wages	10.0	11.0	....	1.0	10.9	13.0	....	2.1
Rent	1.9	2.0	....	0.1	2.6	2.0	0.6	....
Total Expenses	24.9	27.4	....	2.5	27.3	28.4	....	1.1
Net Profit	7.5	6.6	0.9	....	6.2	5.6	0.6	....

SALES VOLUME $100,000 TO $150,000

	100,000 to 500,000 Popul.				Over 500,000 Popul.			
	Ont.	US	US L	US H	Ont.	US	US L	US H
Cost of Goods Sold	69.0	68.0	1.0	....	70.0	69.0	1.0	....
Proprietor's Salary	5.5	7.0	....	1.5	4.4	7.0	....	2.6
Employees' Wages	12.6	12.0	0.6	....	15.2	10.0	5.2	....
Rent	1.5	2.0	....	0.5	1.5	2.0	0.5	....
Total Expenses	26.8	28.0	....	1.2	27.8	25.5	2.3	....
Net Profit	4.2	4.0	0.2	....	2.2	5.5	....	3.3

SALES VOLUME OVER $150,000

	5,000 to 20,000 Popul.				20,000 to 50,000 Popul.			
	Ont.	US	US L	US H	Ont.	US	Ont. L	U.S. H
Cost of Goods Sold	67.2	66.0	1.2	....	66.0	66.0	....	....
Proprietor's Salary	7.4	6.0	1.4	....	3.3	6.0	....	2.7
Employees' Wages	12.1	13.0	....	0.9	17.1	12.0	5.1	....
Rent	1.2	2.0	....	0.8	1.6	2.0	....	0.4
Total Expenses	25.6	28.3	....	2.7	28.9	27.8	1.1	....
Net Profit	7.2	5.7	1.5	....	5.1	6.2	1.1	....

	Over 100,000 Population			
	Ont.	U.S.	U.S. L	U.S. H
Cost of Goods Sold	64.3	67.0	....	2.7
Proprietor's Salary	3.9	4.0	....	0.1
Employees' Wages	17.4	13.0	4.4	
Rent	3.1	3.0	0.1	
Total Expenses	34.7	25.9	8.8	
Net Profit	1.0	7.1	....	6.1

Chart 21 of the Canadian Pharmaceutical Survey published in the Canadian Pharmaceutical Journal, August 1, 1955, classified Ontario Pharmacies according to Sales Volume only. The charts appearing here break down each sales volume category further into Population Sizes. THIS IS THE FIRST TIME THESE FIGURES HAVE BEEN PUBLISHED. Compare them with your 1954 figures.

H. J. FULLER

BUFFER SOLUTIONS IN PHARMACEUTICAL PREPARATIONS

Dr. Louis N. Elowe

Considerable attention has been given in recent years to the importance of hydrogen ion concentration and its control in different pharmaceutical systems. At times, it is very desirable, if not absolutely essential, to maintain pH values of pharmaceuticals within definite narrow ranges. Moreover, such control is also necessary in some instances during the course of pharmaceutical operations.

Some drugs are stable only at optimum pH levels. To this group belong several alkaloids which are most stable in acid solutions. For example, injection of emetine hydrochloride is adjusted to pH 3.5 because this substance is most stable at such degree of acidity. Cocaine hydrochloride solutions, on the other hand, must be kept below pH 5 in order to prevent excessive hydrolysis of the active ingredient.

In addition to affecting the stability of some medicinals, different degrees of acidity or alkalinity may influence the efficacy of certain substances. Thus it is seen that some drugs function best in a particular pH range and are not active in others, and, therefore, proper adjustment of the hydrogen ion concentration becomes important if full activity is to be expected.

Some pharmaceutical preparations like parenteral solutions, eye washes (collyria), nose drops and nose sprays may cause pain or discomfort to the patient unless they are adjusted to approximately the same pH as that of the body fluids with which they will mix.

The stability of colloids and emulsions is dependent largely on the charge of the colloidal particles. This charge is closely related to the pH of the preparation and, for stability purposes, the pH must be maintained at optimum values. Oil-in-water emulsions made with acacia as the emulsifying agent are most stable at pH values just above 4, whereas those made with tragacanth are stable at pH 2.5.

The extent of the solubility of some materials is influenced by the hydrogen ion concentration of the medium; proper adjustment and maintenance of the pH at the level for the best solubility therefore becomes important. Also, in extraction procedures, the distribution coefficient of the substance to be extracted depends to a considerable degree on the pH level of the medium. It is thus possible to alter the distribution coefficient by varying the pH of the system.

Numerous other instances in which maintenance of a definite acidity or alkalinity is important could be cited. It must, however, be borne in mind that it is sometimes very difficult, if not impossible, to arrive in a particular instance at a pH which is satisfactory from all points of consideration. For example, a certain drug may be chemically stable only in acid media; yet the solution must be alkaline for other purposes. In such cases, the preparation should be adjusted to a pH that is most satisfactory under the special circumstances.

The control of acidity or alkalinity under certain conditions is automatic. Ionization may be self-limiting as in the case of a solution of hydrogen chloride in water. If the factors of temperature and dilution are kept constant, this solution will soon reach an equilibrium between the undissociated molecules and the ions. If there are no outside interferences, the state of equilibrium and thus the pH are maintained. Many of the pharmaceutical preparations are far from being free from outside interfering influences. They are continually prone to changes which may alter the pH of the pharmaceuticals unfavourably. In these cases, the preparations will have to be protected against such undue changes by "buffering systems" that are capable of neutralizing slight changes in acidity or alaklinity.

Buffer solutions may be defined as solutions of known pH value which resist changes in pH caused by dilution, traces of acid or alkaline impurities or added acid or alkali. Generally, a salt of a weak acid, or a combination of a weak acid and its salt (such as acetic acid and sodium acetate), is used for control of solutions on the acidic side. In the same manner, for control of solutions on the alkaline side, a salt of a weak base or a combination of a weak base and its salt (such as ammonia and ammonium chloride) can be used to advantage.

Let us consider the system acetic-sodium acetate (a weak acid and its conjugate base) as a buffer solution. The hydrogen ion concentration of such a solution depends on the dissociation constant of the acid and on the ratio of acid (undissociated molecules) and base (dissociated molecules) in solution. Consequently, the hydrogen ion concentration is unaffected by dilution. The addition of small quantisties of acidic or basic substances will not alter the pH because of their inability to affect the ratio of the acid to base appreciably. Similarly, a mixture of ammonia and ammonium chloride (a weak base and its conjugate acid) possesses buffering capacity.

The hydrogen ion concentration value of a buffer solution can be easily calculated from the dissociation constant of the acid and the ratio of the concentrations of dissociated and undissociated molecules of the acid. Thus, it is possible to prepare solutions of different pH values from the same weak acid and its salt by varying the ratio of the concentration of one to the other. In the same way, in a buffer system of a weak base and its salt, the pH value of the solution is a function of the dissociation constant of the base and the ratio of the concentrations of the salt and the free base. By altering this ratio, different pH values may be obtained.

A number of accurately standardised buffer mixtures are used to obtain solutions of definite pH values. Widely publicized examples are, among others, the mixtures of Sorensen, Gifford, Palitzsch and Clark and Lubs. The choice of a particular buffer solution for a pharmaceutical preparation can only be done by careful and judicious consideration of many factors, such as the dosage form of the preparation, the possibility of incompatibilities and the pH at which it is best to be adjusted and maintained, taking into account the solubility and the stability of the components and, of course, of the preparation itself.

L. N. ELOWE.

SOME EXCERPTS FROM "THE CHANGING ASPECTS IN PHARMACEUTICAL PRACTICE - VIEWED INTERNATIONALLY" BY DR. VIKTOR HAUSER

Dr. Viktor Hauser, President of the Austrian Pharmaceutical Association, presented a paper by this title to the delegates from 41 foreign countries assembled at the general Assembly of the Fédération Internationale Pharmaceutique, London, England, September 23, 1955. In this paper he called attention to the significant changes in the production and distribution of modern drugs and the growth of sickness insurance programs in many countries as a basis for the changing character of the services demanded of pharmacists and the importance of adjustment by the profession to meet the changing order in a manner to assure professional survival.

The following are some pointed excerpts from Dr. Hauser's address:

"But it is not only the sickness benefit societies. Other national institutions are also trying to get the sale of medicaments into their hands, and certain trades in particular have been successful in many countries in obtaining the right to sell proprietary medicines for which no prescription is required, as well as simple herbal mixtures, cough syrups, tonics, etc. The sale of medicines by doctors is also a burning problem, as is the sale in hospitals to patients not attending the hospital and in out-patient departments."

Other pressing problems mentioned are (1) the problem of the ascendancy of proprietary drugs, and (2) the question of discounts allowed to doctors, hospitals, etc.

These problems seem strangely familiar. In his closing remarks Dr. Hauser said:

"I hope that in this report of mine dealing in more or less detail with all economic and other questions, that I have shown you that we pharmacists or dispensing chemists must fight very hard in almost every country in the world for our very existence and that we must take care not to lose any more of the substance of our sphere of activity. The pharmacist or dispensing chemist who in modern times undergoes a period of most intensive training in scientific fields, must not be degraded to the level of a mere shopkeeper but must be what our forerunners always were—the defenders of the people's health."

CANADIAN HOSPITAL PHARMACY SURVEY

For a number of months, Mrs. I. E. Stauffer, Special Lecturer in Hospital Pharmacy and H. J. Fuller, Professor of Pharmacy Administration, both of the Faculty of Pharmacy University of Toronto, have been making an exhaustive survey of hospital pharmacy practice in Canada to determine:

(a) specific, up-to-date information concerning the activities, duties and remuneration of pharmacists employed in this branch of pharmacy in order to utilize the services of more of these graduates in hospitals, and

(b) a complete picture of the opportunities for service in this branch of pharmacy to enable the Faculty of Pharmacy to recruit more students to enter hospitals as full or part-time hospital pharmacists.

The first article pertaining to this Survey appeared in the November, 1955 issue of the Bulletin and Part II appears in this issue. The Chart on page 11 is tenative and subject to change since replies to this questionnaire will be accepted up to January 31. More information concerning this survey will appear in subsequent issues of this Bulletin.

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